

BANKING.

There is nothing simpler than a bank. A number of persons who have money to lend on interest find several advantages in clubbing together and putting their money into a common fund, they consequently form an association with this aim, and such an association is called a bank. The management of the fund is intrusted to experienced business men who are acquainted, or who can make themselves acquainted, with the wealth or poverty of persons applying for the use of any part of the fund, in order that it may be loaned to those who are able to repay it again with the interest agreed upon for its use.

These associations generally have money coming in and going out daily, and it is necessary to provide iron boxes or strong stone closets for its safe keeping, and when these are provided, any person in the community who has a sum of money which he does not want to use immediately, is apt to ask the favor of having it placed in the bank vault till he wants it. The number of persons who thus have money which they do not require for immediate use, and the sums which are consequently left with the various banks for safe keeping, is surprisingly large. The managers soon find by experience that as a portion of these deposits are withdrawn others are brought in, and there is thus a large amount constantly on hand. As business men of property, who can make safe notes, are constantly calling for more money than the capital of the bank amounts to, the directors loan a portion of these deposits, taking care always to keep enough on hand to pay any depositors who are likely to call for it. As the bank pays nothing to the depositors for the use of their money, and as they get interest from those to whom they loan it, they are generally able to make a profit in this way more than enough to pay the expenses of rent, clerk hire, &c.

Besides the interest obtained from money which is left with them for safe keeping, the banks have another source of profit in their circulation. After the credit of certain banking companies became thoroughly established, the discovery was made that they could buy gold and silver, or other articles of value with their notes, and if they made these notes in small amounts, they would pass from hand to hand in exchange for merchandise, the same as coin, and that a certain amount of them would remain constantly in circulation. Banks accordingly exchange their notes not on interest with merchants and other business men for their notes on interest, and thus make a considerable profit. Of course the banks must keep some specie on hand to pay any of those notes that may be presented for payment, as they are all constantly due, being payable on demand. As the bank obtains no interest for the specie which is in its vaults, there is a constant temptation to diminish this below a safe sum, and the numerous failures of banks to pay their notes when they were presented, prompted the legislature of this State to require every bank issuing notes to deposit security for their payment with an officer of the state. As the security required consists of state stocks, mortgages, &c., which draw interest, and as the bank notes draw no interest, the banks make the profit on their circulation in the same way that they did before the passage of this useful law.

When a banking company loans money to a merchant, it is customary to take out the interest at the time of making the loan, counting out the interest, or discounting it as it is called; hence the term discounting has come to be applied to the transaction of making the loan, and the whole amount of money out at interest is embossed in bank returns under the term of discounts. The banks of this State are required to publish a statement weekly of their average deposits, circulation, discounts and specie, for the week. The statement for the week ending Feb. 23, of the condition of the banks of this city, is as follows:

Capital.	Loans.	Specie.	Circulation.	Deposits.
\$60,113,652.	\$119,230,250.	\$35,014,759.	\$5,128,792.	\$91,028,626.

A portion of the deposits are fictitious or nominal merely, as we shall show in a subsequent article.

The *Great Eastern* is now getting ready to make a second voyage to New York, as a regular trader. It is expected that she will start on the beginning of next month (April). This second voyage, if she has any, thing like a tolerable cargo, will afford a better criterion of her speed and capacity than her former trips across the Atlantic.

CALIFORNIA WAKING UP TO INVENTIONS.

We believe California, at the present time, to be the best State in the Union for the introduction of new and improved machines and implements of utility, and that the day is not distant when she will surpass many of the New England States in the number of her inventions.

Within a year past, quite a number of very excellent improvements have been patented by the residents of the Golden State, and we have observed in our large correspondence with her citizens that their tastes and interest in mechanical matters are rapidly increasing. Almost every month California brings to this office alone, from five to ten orders to prepare applications for Letters Patent, and most of the models sent in show as much perfection in their make and finish as those got up in our Eastern cities, while the inventions which they illustrate compare favorably with those from any section of our country.

It augurs well for the prosperity of any State to have her people interested in mechanical and manufacturing pursuits; and the rapid development of this class of industry, in connection with the native resources of this young State, will make it in a very short time the most prosperous, as well as the richest, of any in the whole Union.

Patents in the Southern States.

At the Southern Congress, now sitting at Montgomery, Ala., on the 16th ult., Mr. Brooke, Chairman of the Committee on Patents, offered the following resolution:—

Resolved, That J. M. Waldron, a citizen of the State of Georgia, be and he is hereby authorized to file with the Attorney General, a caveat, accompanied by suitable drawings and explanations, setting forth the design and purpose thereof, for the protection of an improvement claimed to have been made by him in railroad switches; and that said caveat, when so filed, as aforesaid, shall be effectual from this day to protect his right to said invention, until a Patent Office shall be established; *Provided*, That as soon as said office is established, said caveat shall be filed, with the commission thereof, and such proceedings had thereon as may be authorized by law.

Mr. CONRAD said he did not know whether it was the understanding of the Committee on Patents, or the understanding of Congress, that the cognate subject of copyrights is included in the consideration of the Committee on Patents. If it be not so, he moved that the committee be denominated the Committee on Patents and Copyrights. He made that motion, because he had a document about copyrights which he desired referred to that committee.

THE PRESIDENT asked the committee to state whether they regarded that matter as under their supervision.

Mr. BROOKS, the chairman, replied that the committee regarded the subject of copyrights as under their cognizance.

The communication presented by Mr. CONRAD was then referred to the Committee on Patents.

Mr. BROOKS also reported a bill, which was only read by its title, as follows:—"A bill to establish a patent office, and to provide for the granting and issuing of patents for new inventions and improvements." The bill was ordered to be printed.

CORROSION OF STEAM BOILERS.—By order of the Secretary of the Navy, a board has just convened at the Smithsonian Institution, consisting of Professor Henry, Engineer-in-chief Archbold, and Chief Engineer John Woodcock, Leonard and Shock, to investigate the causes of the sudden corrosion of the boilers of the U. S. steamer *Duane*. The corrosion is singular and extraordinary. The vessel is one of the latest models constructed; and her engines are fitted like those of other steamers, with condensers. The corrosion has so rapidly progressed that, in three months, the most important parts have been eaten one-third through. As this corrosion has not appeared in the boilers of the other steamers constructed of the same iron, as nearly as can be ascertained, and with surface condensers, the problem has been deemed sufficiently important and complicated to require for its solution the employment of a most able board of investigation.

THE HARD WINTER IN EUROPE.—The *Press Scientifique du Deux Monde*, in speaking of the unparalleled hard winter in Europe, says that the snow caused great obstruction to the railroads, and produced many accidents in England as well as in France. It then goes on to give a minute history of all the accidents on the English roads, without saying anything word about those which occurred in its own country!

AMERICAN ENGINEERS' ASSOCIATION.

(Reported for the Scientific American.)

On Wednesday evening, February 13th, the regular weekly meeting of this association was held at its room, No. 24 Cooper Institute, this city.—Thos. B. Stillman, Esq., President; Benj. Garvey, Esq., Secretary.

MISCELLANEOUS BUSINESS.

The collection of the dues owing to the association was taken up and commented upon by the members present. There were on the books of the society the names of many persons who had not paid their initiation fee nor their regular dues, and as it was very probable they never intended to do so, it was resolved that the names of such persons as had been enrolled as members for three months, and had failed to pay their dues or any other indebtedness, be stricken off the list of members of the association.

The signatures obtained to the memorial (as published in the *SCIENTIFIC AMERICAN* of March 24) were handed in to the secretary. A special committee was selected by the association to take charge of this memorial, and present it, with suitable suggestions, &c., to the Legislature. That committee consists of Messrs. Stillman (President), Rooder and Garvey. Considerable discussion ensued in regard to the propriety of submitting this memorial to the present Legislature, as there was already a similar bill before them, and it had been favorably received and reported upon; the passage of this bill would appoint Messrs. Faron, Boardman and Birkbeck as Inspectors of Engines, Boilers, &c., in this city; but as these gentlemen were in no wise connected with the Engineers' Association, or, at least, did not represent them, it was thought eminently proper that they should be heard upon the enactment of such a law, and consequently their original resolution of immediately submitting it to the Legislature was adhered to, together with the names of several engineers whose competency and character could not be assailed, with their unqualified recommendation as suitable men to be appointed as inspectors; they did not presume to dictate to whom the Legislature should give these offices, but presumed that, from such a list as they would present, the necessary number could be selected. This method would certainly insure the appointment of men whose qualifications could not be questioned.

The names of Messrs. Charles W. Copeland and J. H. Leman were referred to the Committee on Administration of Members.

Upon the balloting for the election of members, Messrs. Wm. Smith, J. H. Quick, John King, Edward Marsden, A. L. Flerty, James Van Ripper and R. Hutchinson were duly elected.

REPORTS.

THE TREASURER submitted his annual report to the association. It was accepted, and referred to a special Auditing Committee, the President appointing as such committee Messrs. Gar, Simpson and Koch.

THE SECRETARY submitted an abstract of his annual report. The document exhibited a very satisfactory condition of affairs, and represented that the names of one hundred and nine engineers, mechanics, &c., were on the books of the society. This document was also referred to the same committee, to whom was given the power of taking charge of and examining all the books, papers, &c., belonging to the society, and reporting to the members the entire proceedings of the association during the past year.

On motion of Mr. G. F. Hoxsey, a vote of thanks was awarded to Mr. John C. Merriam for the gratuitous publication, in the *American Engineer*, of the constitution and by-laws of the society.

On motion of Mr. SIMPSON, it was resolved to authorize the Committee on Printing and Publication to have the constitution, &c., immediately printed in pamphlet form.

ELECTION OF OFFICERS.

At this juncture, it was resolved to proceed to the election of officers for the ensuing year. Messrs. Holden, Koch and Merriam were appointed tellers. There were nineteen votes cast, and the result, upon counting, was found to be as follows:—

For President.....	Thomas B. Stillman.
For Vice-Presidents.....	Charles Bernard, Charles H. Haswell, J. B. Kierstead.
For Secretary.....	H. E. J. Gray.
For Treasurer.....	Robert J. Gray.

"DEPOSITION OF KING COTTON."

One of our contemporaries, under the above heading, exults over the decease of "King Cotton," and shouts aloud for his successor "King Wool." In times of public excitement common sense frequently takes aerial flights, and it has done so in this case. Our contemporary says, respecting cotton:—"We have to provide a substitute, and Providence, which is liberal as well as wise in disposing its favors, gives us a compensation. Henceforth, if we be wise, wool will replace cotton." It then goes on to advance proof and argument to show that wool can be produced in quantities sufficient to take the place of the cotton we have been accustomed to use. It states that our annual consumption of wool has been about seven pounds per head, and that this may be doubled if not tripled.

We have sought in vain to obtain accurate statistics respecting the annual home consumption of wool, but that of cotton amounts to 308,295,000 lbs. But even if the crop of wool were to be trebled, it would, according to the above standard, only amount to 630,000,000 lbs., which would be a very inadequate supply for the quantity of cotton that has been hitherto required. In the port of Liverpool no less than 1,314,491,342 lbs. of cotton were received in 1860 and only 483,715,472 lbs. of wool. These figures, showing the quantities of cotton and wool that arrived at Liverpool—celebrated for its imports of manufacturers' materials—afford, according to our notion, good comparative data of the two crops all the world over.

The average yield of American glined cotton to the acre of land has been 252 lbs. It will take eight acres of land devoted to sheep culture to raise the same quantity of wool. The demand for wool has generally exceeded the supply even when cotton was free for sale. We, therefore, consider that those who have stated that wool can be raised in sufficient quantities to supply the place of cotton, have drawn upon their fancy for facts.

We think we can "see through a millstone" just as far as any other person, but we confess our utter inability to offer a sensible prediction as to the future of cotton. We know—because it is self-evident—that if cotton cannot be obtained in sufficient quantities next year, there will be a great demand for some substitute, and if its price be double or triple that formerly paid for cotton. It appears to us that flax is the only material that seems to be capable of supplying this want to a very considerable extent; hence, we have exhorted farmers to make preparations for its cultivation upon an enlarged scale. At the same time, we also urge more devotion to sheep culture, as there will certainly be a full demand for all the wool that can possibly be raised.

A NORTHEAST STORM MOVES AGAINST THE WIND.

Dr. Franklin observed that the northeast storms on the east side of the North American continent usually commence at the southwest and travel against the wind; and the fact of this apparently impossible operation has been confirmed by all subsequent observation. So well established is the law, that since the construction of telegraphs, it has been customary in Washington to arrange the door openings of telegraph offices to the southwest. A graphic report of the weather at the southwest. A northeast storm, commencing in South Carolina usually reaches New York in from 18 to 30 hours, and continues at the same rate to Boston, Portland and Halifax. When telegraphs were first established it was repeatedly suggested that the intelligence which they would furnish of the weather at the southwest would prove a safe guide for the departure of vessels from our harbor, but we are not aware that an organization was ever formed among our merchants for the purpose of procuring this valuable knowledge.

Though it might seem at first sight impossible for a storm to move against the wind, when the fact is fully established it is not difficult to find an explanation. Clouds are formed by the condensation of vapor in the air which is invisible until it is condensed. As the wind comes from the comparatively warm ocean lying to the northeast, it is loaded with vapor which is condensed as the air is cooled down to the dew point. The winds at first blow a long way over the land, reaching the foot of the Allegheny mountains before they become sufficiently cooled to

cause the condensation of the vapor which they contain. The reduction of temperature however extends backward into the current, cooling it, and forming cloud and rain. So, though the clouds are constantly moving with the wind, the border of the falling rain is constantly travelling backward against it. It is easy to see that the rate at which it travels will vary with the varying difference between the temperature of the ocean and that of the land.

TRANSFERRING STEEL ENGRAVINGS ON BANK NOTES.

In the course of our business we are in the way of receiving bank bills from all parts of the country, and having observed that the engraving of those made by the National Bank Note Company is of a very superior quality, our attention was thus called to their establishment; and the idea suggested itself that there might be something in the process that would interest our readers. We propose to describe at this time only the mode of transferring steel engravings.

The portraits and other small pictures which are engraved on bank notes are used on several plates without being reengraved, and as the engraving of these, in the high style of the art employed, costs some two or three hundred dollars a piece, the process by which they can be transferred from one plate to another saves an enormous expense. Before a window, with the best light which can possibly be obtained, the engraver sits at his bench, with his magnifying glass at his eye, and before him a small steel plate about an eighth of an inch in thickness and perhaps two inches square. He has in sight a drawing, say of the head of Washington, which it is his business to copy upon the steel plate, by scratching lines in the plate with a small steel point. The plate is softened by annealing before it is engraved, and is afterward hardened by a process which we will describe at another time. The lines which the engraver makes in the plate are to receive the ink, and he accordingly makes them broad and close together in the dark parts of the picture and omits them entirely in the high lights. This work requires the utmost care and is exceedingly slow, demanding weeks, and even months to engrave a single head; and as the labor is performed by artists who can command high pay, the engravings are very costly.

As the engraving is finished the plate is hardened and the engraving is then transferred to the periphery of a small steel roller. The rollers are two or three inches in diameter, with faces of different widths for engravings of different sizes, and they have holes through their axes about an inch in diameter for mandrels. The plate being hardened, and the temper of the roller being drawn, both are placed in the transferring press. This consists of a massive iron lever about five inches square, the farther end of which is forced up by a second lever with the fulcrum very near one end, by which means the end of the large lever next the workman can be forced down with very great power. The roller is slipped on a mandrel and placed under the lever, with the engraved plate on a platen below it. The platen rests on friction rollers between smooth guides, and when the workman has brought the pressure of the lever upon the mandrel of the roller, he moves the platen many times back and forth, thus rolling the roller repeatedly upon the engraving under great pressure. As the engraving is rolled off the hard plate, the roller, the soft metal of the roller is pressed into the grooves of the plate, and a reversed transfer of the engraving is produced. The roller is then hardened, and, by a precisely similar operation, in the same press, the engraving is transferred to the plate from which the bank note is printed. As the second transfer again reverses the engraving, the depressions and elevations on the second plate are the same as on the first.

The National Bank Note Company have large safes filled with these rollers, bearing upon their peripheries the transfers of engravings. The engravings are so costly that the rollers are worth far more than their weight in gold, and they constitute so considerable portion of the capital of the company.

The aggregate receipts for the six principal lines of railway in France, from January to October, 1861, amounted to—amounted to about \$59,863,430, which is an increase of more than \$6,000,000 over the receipts during the same period of the previous year.

THE SUCCESSORS OF THE URETS.

The words sulphure, carburet, cyanuret and the others of this class are now obsolete, having been replaced by sulphide, carbide, cyanide and the others. The editors of the *American Journal of Science and Arts* and a few other writers, in dropping the *ure* supplied its place with *id*, writing carbid, sulphid, &c., and on another page will be found the reasons for this orthography, stated with remarkable clearness by the editor of the *American Journal of Photography*. Some of the principal chemists in the city have represented to us that, as the SCIENTIFIC AMERICAN has by far the largest circulation of any scientific publication in the world, the course that we take will probably decide which termination shall be adopted.

It is a matter of small importance, and it seems to us that it is hardly worth while for the chemists of this country to separate themselves in this matter from those of Germany, France and England. We should like to see not only a common nomenclature but a common thermometer, a common unit of atomic weights, a common system of weights and measures, and as many things as possible in common universally adopted throughout the world of science. In order to do this some must give way, and we are not sorry that Americans have the opportunity to take the lead in the emulation of small sacrifices which is necessary to bring the men of science of all nations upon a common ground. We are in favor, therefore, of retaining the final *e*, and we think that the editors both of the *American Journal of Science and Arts* and of the *American Journal of Photography* will finally approve of our decision.

Death of an Eminent Patent Lawyer.

The name of Seth P. Staples has been familiar to us for many years, but in announcing his death we are somewhat surprised to find that he had attained to so great an age. He was born in Canterbury, Conn., Sept. 1, 1776. His father, the Rev. John Staples, was a lineal descendant of Miles Standish of the Plymouth Colony. He entered Yale College in 1794, and, on graduating in 1797, received an honorable appointment, and immediately afterwards commenced the study of law, and was admitted to the bar at Litchfield, Conn., in 1799. He practiced with considerable success in that State, where he founded the Law School connected with Yale College. In the commencement of his legal career, he was elected a member of the Connecticut Academy of Arts and Sciences, and subsequently was representative in the State Legislature for seven or eight sessions, and retired from political life in 1816. He afterward removed to New York city, where he attained the summit of his profession, first as a commercial solicitor, and then as a lawyer in patent cases. He was at one time the leading counsel in this class of cases and was connected with the Goodyear India Rubber suits, the Tatham Lead Pipe cases, the Wilder and Herring Sale litigation and many others. He was considered an able and upright lawyer.

Railways of Great Britain.

From two bi-monthly returns last issued, it appears that the aggregate number of miles of railway open for traffic in the United Kingdom at the end of 1860, was 10,433, against 10,002 miles at the end of 1859. The total number of passengers conveyed on those railways in the year 1860 was 163,435,678, against 149,757,294 in the year 1859, showing an increase of 13,678,384. The total traffic receipts for the year 1860 amounted to £27,756,622, against £25,743,502 in the year 1859, showing an increase of £2,023,120.

The total working expenditure amounted to £13,187,368, or 47 per cent of the receipts. There were £14,579,254 for the year applicable to the purposes of interest and dividend on the loan and share capital of the various Railway Companies of the United Kingdom. Of the total working expenditure 18.48 per cent was for the maintenance of the permanent way; 28.83 per cent for locomotive power; 8.49 per cent, for repairs and renewals of carriages and wagons; 22.05 per cent for traffic charges; 3.03 per cent for rates and taxes; 2.75 per cent for government duty; 1.37 per cent for compensation for accidents and losses; 8.10 per cent for miscellaneous expenses; making the total working expenditures above stated. The total income was about £138,833,000,